

MAY 22 2007

Appl. No. 10/780,946
Reply to Non-Final Office Action of February 22, 2007

REMARKS

Claims 1-23 are pending in this present application. Claims 9-16 are withdrawn. Reconsideration and allowance of pending Claims 1-8 and 17-23 of this application are respectfully requested.

Claim Rejections under 35 U.S.C. §103(a)

The Action rejects Claims 1-8 under 35 U.S.C. §103(a) for allegedly being obvious over U.S. Patent Application No. 2002/0160318 to Richter ("Richter").

Claim 1 recites "... exposing a first set of areas of the photoresist to a first light source through a first mask to activate a photoresist dissolving agent generator of a first type to release a first photoresist dissolving agent in the first set of areas; and exposing a second set of areas of the photoresist to a second light source through a second mask to activate a photoresist dissolving agent generator of a second type to release a second photoresist dissolving agent in the second set of areas ..."

In short, the method of Claim 1 uses at least two masks, e.g., the first mask and the second mask, to define the first set of areas and the second set of areas, respectively.

As conceded by the Action, Richter fails to disclose that a first mask and a second mask are used during the two exposure steps. However, the Examiner alleged that one of ordinary skill in the art would modify Richter's method by using more than one mask because two different exposures are taking place. Applicants respectfully disagree.

Richter is directed to a method for structuring a photoresist layer. Richter exposes a photoresist layer in parts to light from the defined wavelength range $\Delta\lambda_2$, the wavelength of the light being chosen so that the photoacid generator is substantially inert to the irradiation. (Paragraph [0039]). The photoresist layer is then subjected to light from the wavelength range $\Delta\lambda_1$ without using a photomask, such that the acid is liberated from the photoacid generator (Paragraph [0040]). Clearly, Richter uses only one mask in the two exposures to expose the photoresist layer.

Appl. No. 10/780,946
Reply to Non-Final Office Action of February 22, 2007

MAY 22 2007

Further, Richter exposes the photoresist layer to the light from the wavelength range $\Delta\lambda_1$ **without a photomask** in order to generate an excess of acid. (Paragraph [0042]). The excessive acid is required for a subsequent cleavage reaction created by a heating step. (Paragraph [0043]). In the heating step, the acid reacts with acid-labile molecular groups in the film-forming polymer so as to liberate alkali-soluble groups on the polymer and increase the solubility of polymer in alkaline solutions. (Paragraph [0043]). If the acid is not sufficient, a desired cleavage reaction may not occur. As a result, the solubility of polymer is reduced and a steep profile of the photoresist layer cannot be achieved. Richter thus clearly and intentionally discloses using the irradiation step **without a photomask** to generate excessive acid. Accordingly, Richter teaches away from the claimed features of Claim 1. One of ordinary skill in the art would not have been motivated to modify Richter's method to achieve the features recited in Claim 1.

From the foregoing, Claim 1 is not obvious over Richter. Withdrawal of the rejection of Claim 1 is therefore respectfully requested.

Claims 2-8 depend from Claim 1. Claims 2-8 are also distinguished from Richter by virtue of their dependencies. Withdrawal of the rejections of Claims 2-8 is respectfully requested.

Common ownership

The Action also rejects Claims 17-23 under 35 U.S.C. §103(a) for allegedly being obvious over Richter in view of U.S. Patent Application No. 2004/0234897 to Ho ("Ho").

The inventions of Ho and the present application were, at the time the invention of the present application was made, owned by or subject to an obligation of assignment to Taiwan Semiconductor Manufacturing Corporation (TSMC), Hsinchu, Taiwan. The assignment of Ho to TSMC was recorded at Reel 016230, Frame 0828. The present application was subject to an obligation of assignment to TSMC at the time the present invention was made, as noted above.

Therefore, Ho is disqualified as prior art under 37 CFR § 103(c). Withdrawal of the rejection of claims 17-23 over Richter in view of Ho is respectfully requested.

Appl. No. 10/780,946
Reply to Non-Final Office Action of February 22, 2007

Based on the foregoing, reconsideration and withdrawal of the rejections of Claims 1-8
and 17-23 are respectfully requested.

Appl. No. 10/780,946
Reply to Non-Final Office Action of February 22, 2007

MAY 22 2007

Conclusion

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. Early notification to that effect is respectfully

The Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to deposit account 04-1679.

Respectfully submitted,

Dated: May 22, 2007


Mark J. Marcelli, Reg. No. 36,593
Attorney for Applicants

DUANE MORRIS LLP
101 West Broadway, Suite 900
San Diego, CA 92101
Telephone: (619) 744-2200
Facsimile: (619) 744-2201